

**Introduction to  
Orbital Sciences Corporation**

**Presented to  
NASA OSSA Suborbital Science  
Sounding Rocket Workshop**

**Prepared by  
Space Data Division  
Orbital Sciences Corporation**

**12 November 1991**

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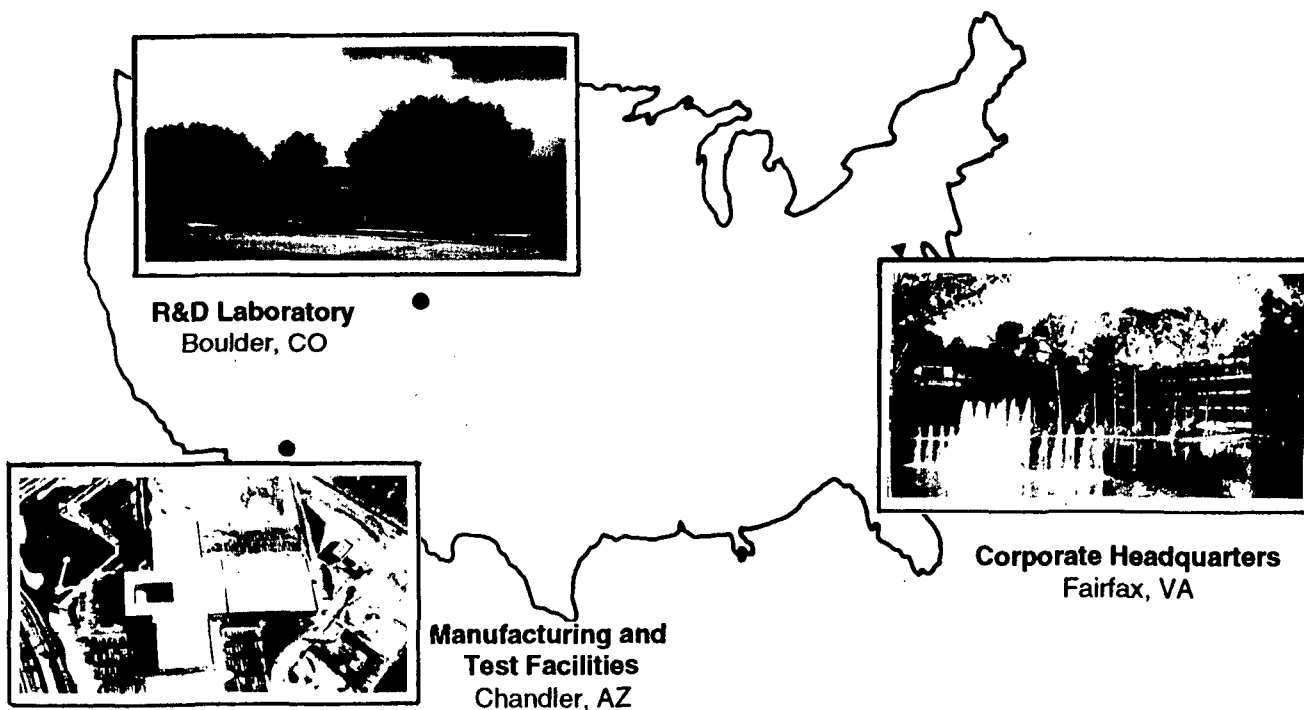
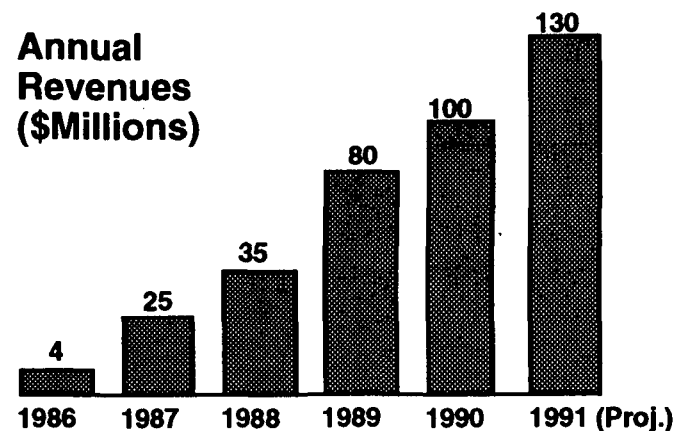
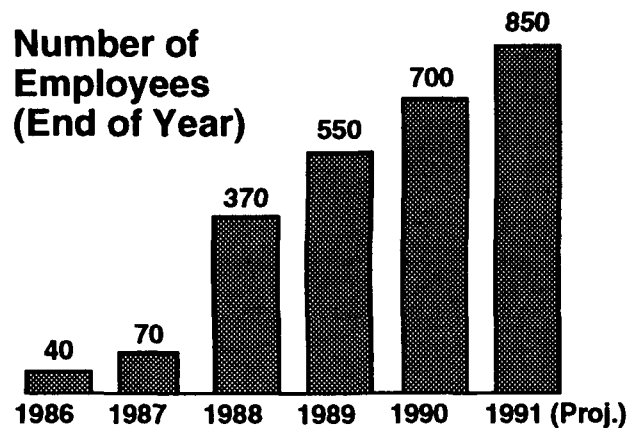
## Introduction to Orbital Sciences Corporation



- Market Leader in Small Space Systems
  - Over 150 Launch Vehicles and Satellites Under Contract, Representing \$750 Million Order Backlog
  - 9 Launches Conducted in 1990; 18 Launches Planned in 1991; Over 25 Launches Scheduled for 1992
- Technology Innovator and Low-Cost Producer in Small Space Systems
  - Suborbital and Space Launch Vehicles
  - Orbit Transfer Vehicles
  - Spacecraft Systems and Payloads
  - Satellite-Based Communications and Remote Sensing Services
- Strong Industrial and Financial Capabilities
  - Over 800 People on Staff, Including 475 Engineers and Scientists
  - Over 350,000 Square Feet of Engineering, Manufacturing and Administrative Facilities
  - Approximately \$130 Million in Projected 1991 Sales; \$135M in Total Assets

# Orbital's Manpower, Facilities and Financial Growth

Orbital  
Sciences  
Corporation



# Orbital's Organization and Management Team

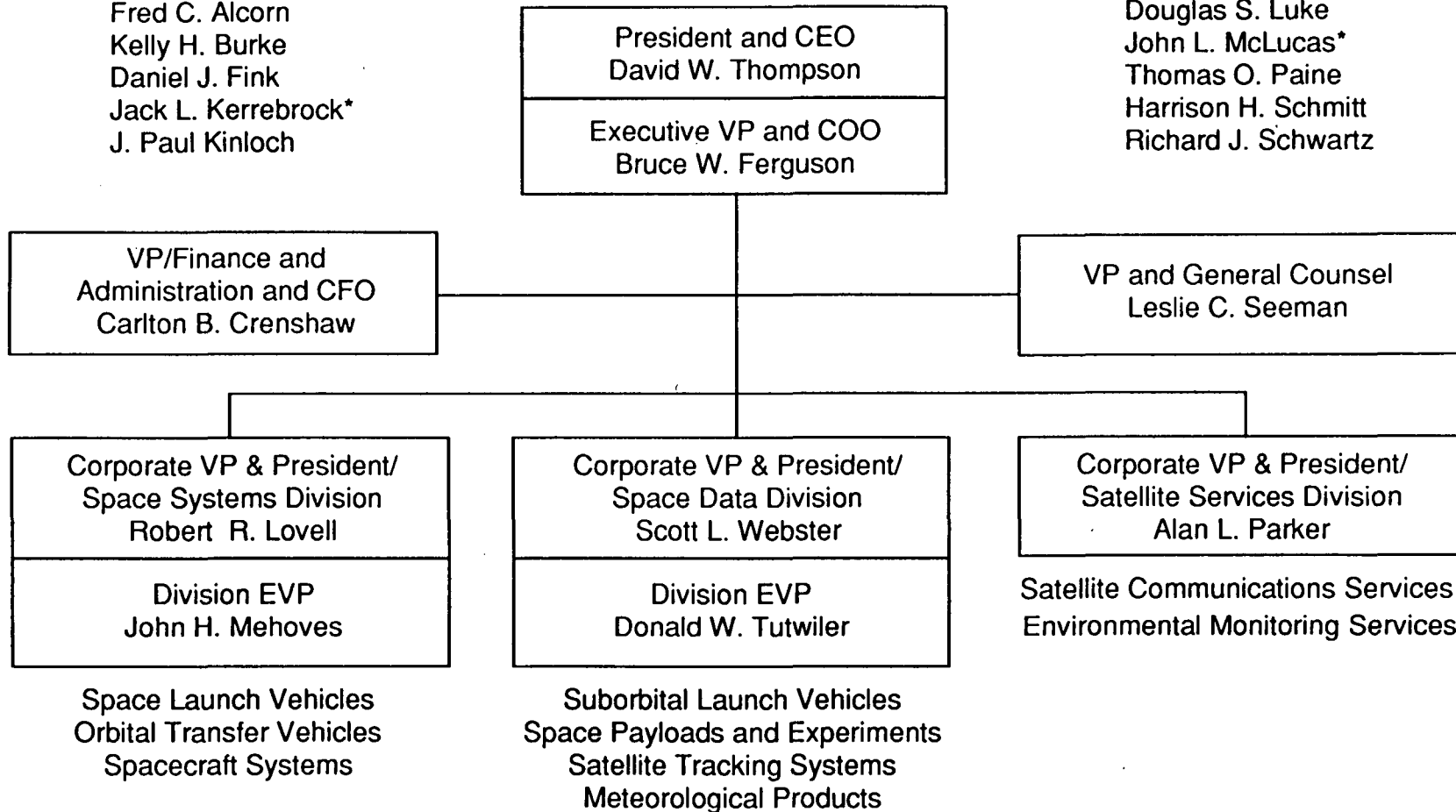


## Outside Members Board of Directors

Fred C. Alcorn  
Kelly H. Burke  
Daniel J. Fink  
Jack L. Kerrebrock\*  
J. Paul Kinloch

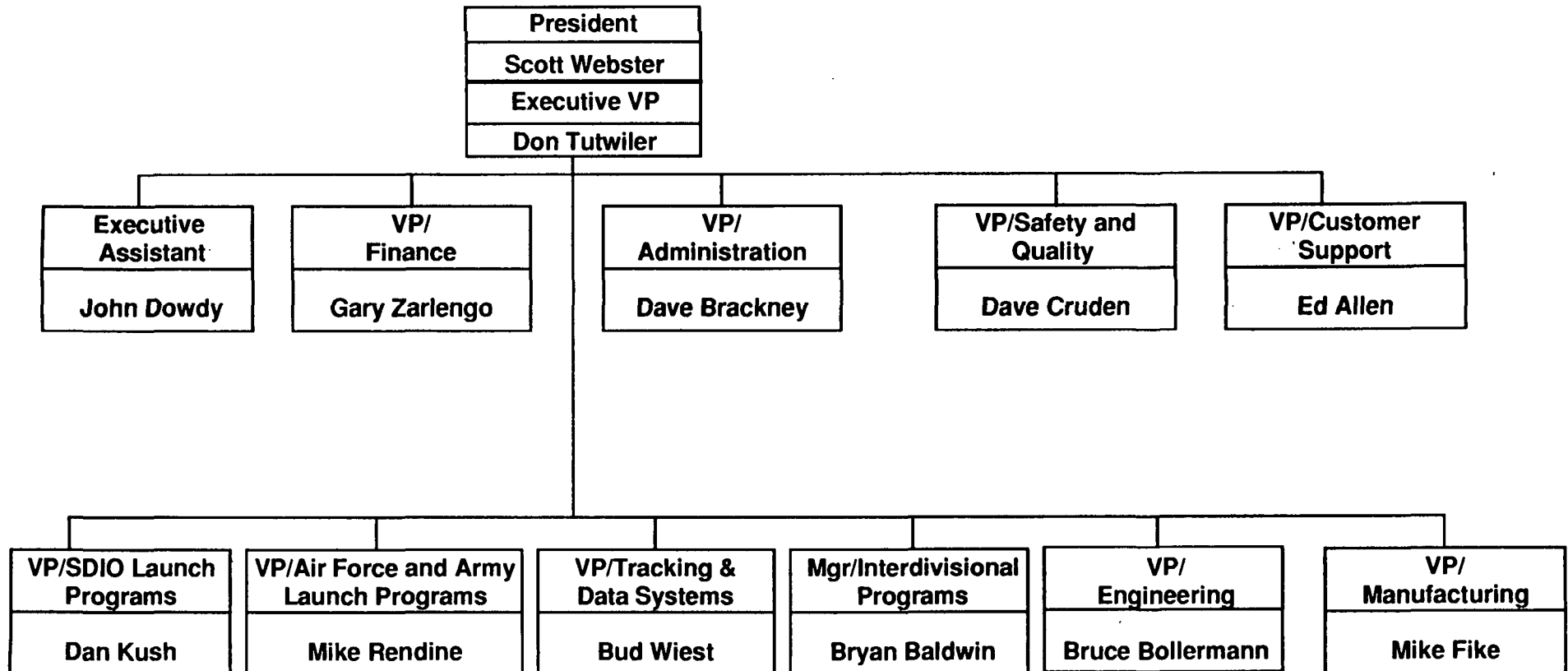
## Outside Members Board of Directors (cont'd)

Douglas S. Luke  
John L. McLucas\*  
Thomas O. Paine  
Harrison H. Schmitt  
Richard J. Schwartz

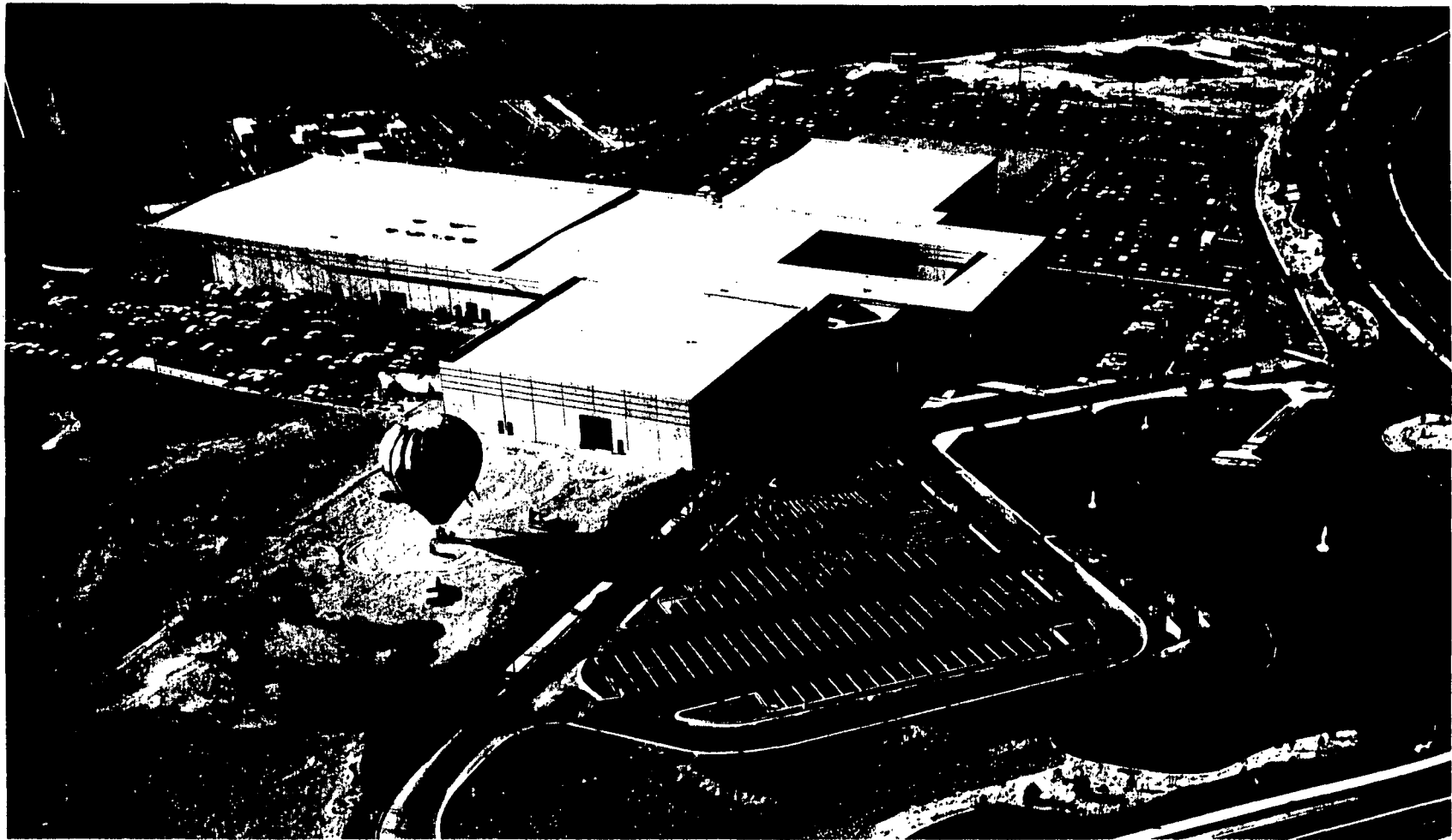


\*Subsidiary Board (Orbital Research Corporation)

# Space Data Division Organization



# Chandler Facility



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## **Space Data-Products and Services**

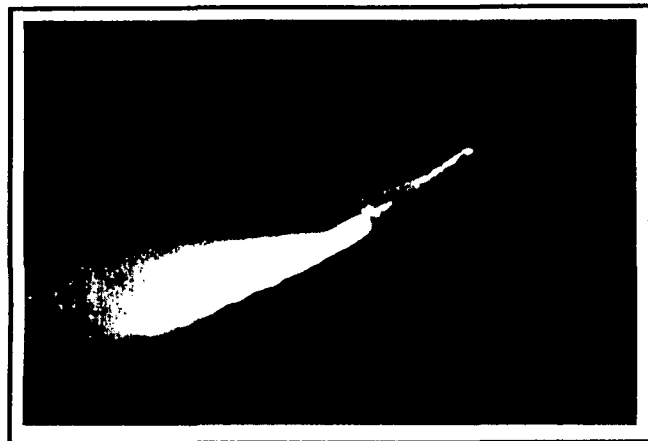
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- Launch Vehicles/Services
  - Unguided
  - Program Guided
  - Inertially Guided
- Payloads
  - Bus
  - Payload Support System
  - Payload Integration
- Support Equipment
  - Launchers
  - Vehicle Handling Equipment
- Tracking and Telemetry Products
- Meteorological Products

# Space Transportation Systems

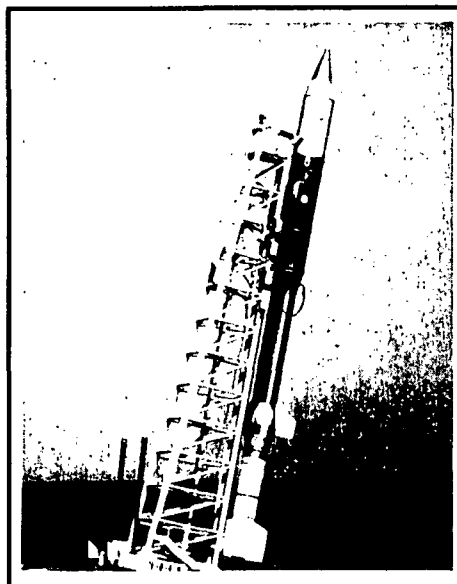
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**Space Launch Vehicles**



**Orbit Transfer Vehicles**



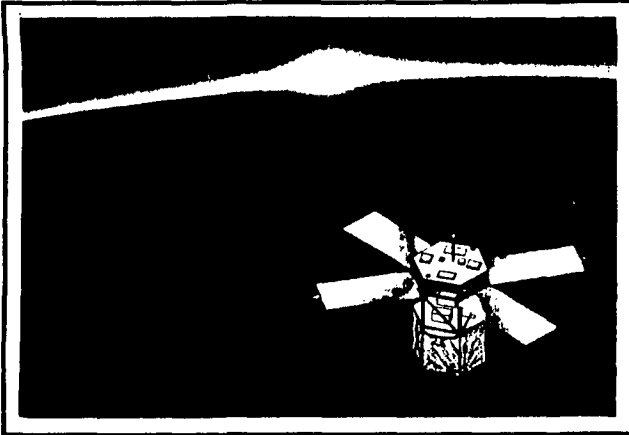
**Suborbital Launch Vehicles**

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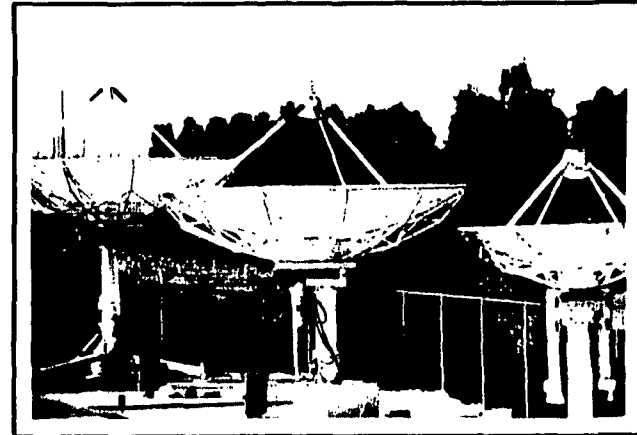


# Spacecraft and Space Support Systems

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**Spacecraft Systems**



**Space Support Products**



**Space Payloads**

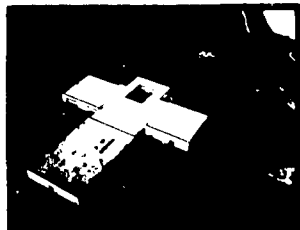
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# Turn-Key Suborbital Launch Services and Support Systems

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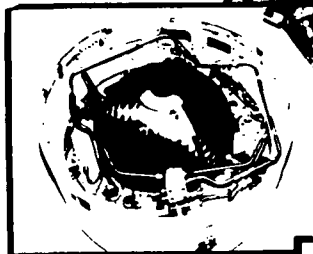
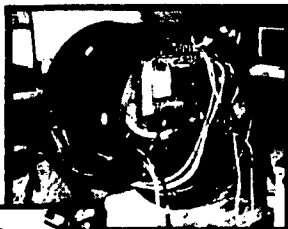


Complete vehicle  
design and analysis

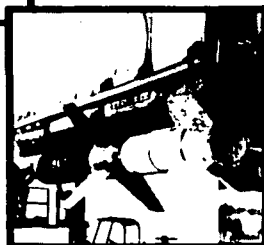


Low-cost fabrication  
and component assembly

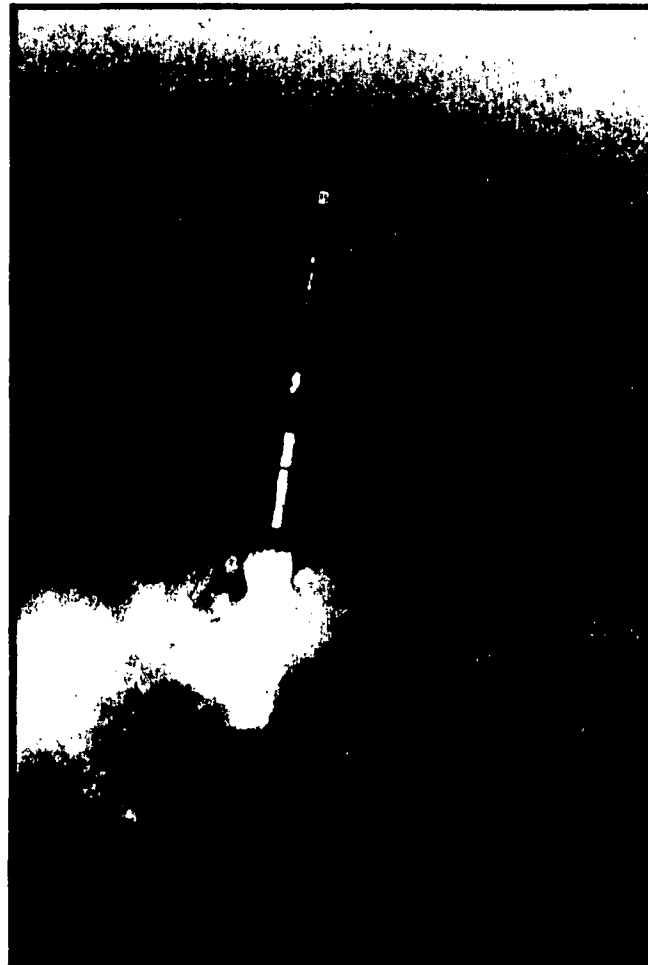
Proven final  
assembly and test



Demonstrated instrument  
and payload integration



Worldwide launch  
operations



State-of-the art  
launchers and ground  
support equipment

Reliable payload  
recovery systems



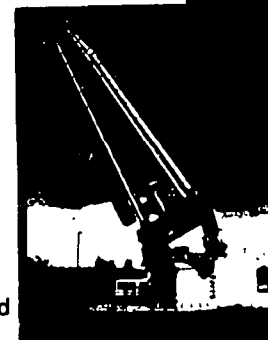
Complete range  
support systems



Versatile tracking and  
data collection systems



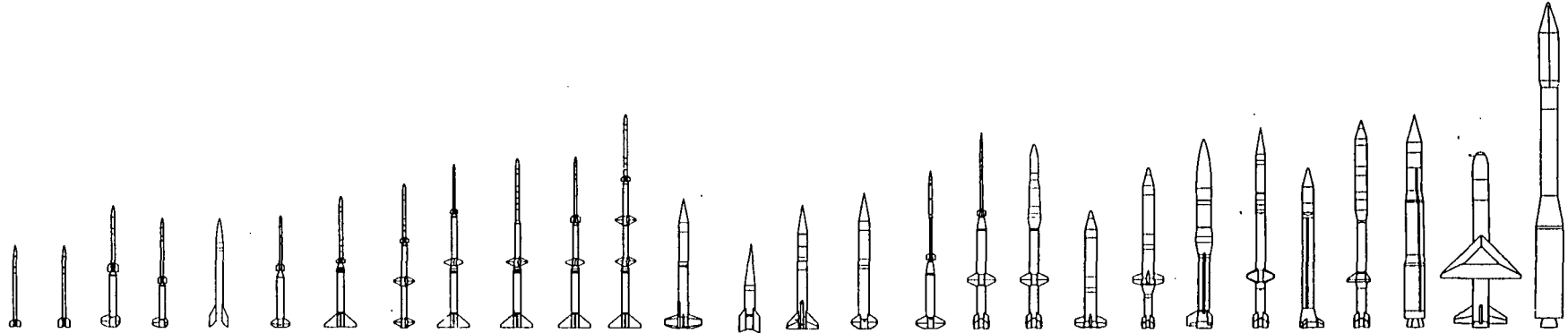
Modular payload and  
mission support  
systems



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# Representative Space Data-Produced Launch Vehicles

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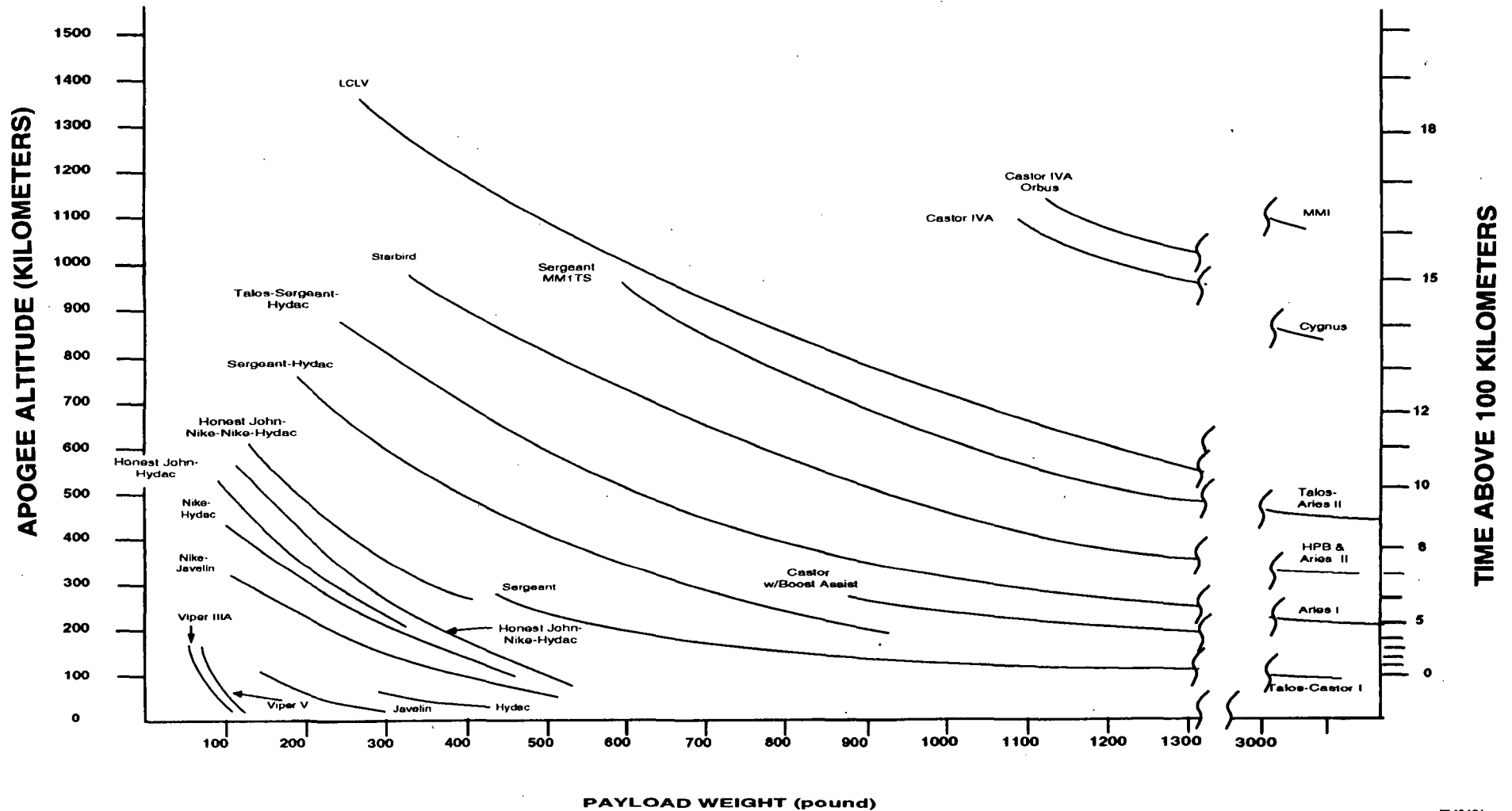


Vehicle	Javelin	Hydac	Nike-Javelin	Nike-Hydac	Black Brant VC	Improved Honest John-Javelin	Honest John-Hydac	Nike-Nike	Honest John-Nike Javelin	Honest John-Nike	Honest John-Nike-Hydac	Honest John-Nike-Hydac	Castor 1 Boost Assisted	Pedro	Sgt with Boost Assist	Sergeant	Sgt-Hydac	Takos-Sgt-Hydac	Takos-Sgt-M57A1 (LCLV)	Aries	Takos-Aries (HPB)	Sgt-M57A1 (ERINT/ETS)	Takos-Castor	Castor IVA (Prospector)	Starbird	Minuteman I	Pegasus	Taurus
Category	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Sub-orbital	Orbital	Orbital
Height (in )	180	216	324	360	355	360	444	468	528	564	564	708	444	360	396	402	545	680	650	460	565	521	665	557	689	718	590	1100
Liftoff Weight (lb)	550	700	1,900	2,100	3,000	3,800	5,700	3,100	6,100	6,000	6,300	7,600	12,600	4,800	10,500	9,000	10,500	13,500	15,300	16,000	20,000	15,530	18,000	27,000	16,400	69,500	41,500	150,000
Typical Gross Payload Weight (lb)	160	200	240	360	440	300	300	570	275	600	280	200	2,400	800	2,000	1,800	340	700	1,200	2,000	3,000	2,988	4,000	1,440	900	2,100+	600	3,400
Payload Dia (in.)	7-9	9	7-12	9-12	18	9-12	9-12	12	9-12	12	9-12	9	32-36	30	32	17-32	9-18	9-18	32	20-48	20-48	40	32-36	40	40	32	50	58
Apogee (X10 <sup>6</sup> ft)	.12	.22	.42	.42	.88	.58	.65	.14	.78	.20	.80	1.2	525	---	.34	.34	1.8	1.3	1.9	1.1	1.1	.58	0.6	2.6	1.1	4.0+	---	---
Apogee Sensitivity (K/10 lbm)	6.7	8.2	16.4	16.4	28.7	16.4	16.4	1.5	8.4	1.5	27.3	41	2.2	---	1.6	6.6	30.0	50.0	16.7	4.5	5.0	2.3	2.0	12.0	12.0	---	---	---
Launch System	Rail	Rail	Rail	Rail	Rail	Rail	Rail	Rail	Rail	Rail	Rail	Rail	Rail	Aircraft (F-4)	Rail	Rail	Rail	Rail	Rail	Rail/Stool	Rail/Stool	Rail/Stool	Rail	Stool	Rail	Stool	Aircraft (B-52)	Stool
Programs/Customers	ICE-CAP/DASA	ICE-CAP/DASA	Energy/DASA NRL DNA	Aurora/BSD AFGL DNA	DASA	ICECAP/DNA	Wide Band Aurora/DNA	Smoke/DASA	Secode/DNA	Smoke/DASA	HJIV	HJ-2/BSD	Recovery/DNA	FLAGE DNA	SWIR-Ballistic/DNA	FWIR/DNA	HAVE JEEP/BSD	HAVE JEEP/BSD	LCLV/BSD	Spear II/DNA	HPB/AFGL	ETS USASDC	Spirit II/AFGL	Jous/U of A	Starlab/USAF	RSLP/BSD	ASTP/DARPA, STP/USAF	ASTP/DARPA Comm
Range Compatibility (A)	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	3,7	1,2,3,5 6,7,8,9	1,2,3,5 6,7,8,9	1,2,4	1,2,5,6 7,8	1,2,4,5 6,7,8	All	1,2,5,6 7,8	All	1,2,5,6 7,8	All	2,8	4	1,2,4,7,8 and Other	2,4

(A) 1-Wallops 2-ETR 3-WSMR 4-WTR 5-Poker Flat 6-Barking Sands 7-Kwajalein 8-Wake 9-Eglin

# OSC Suborbital Booster Performance

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APOGEE ALTITUDE (KILOMETERS)

